

# Article

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## A new genus and five new species of the Meconematini (Orthoptera: Tettigoniidae: Meconematinae)

HANQIANG WANG<sup>1</sup>, XIANWEI LIU<sup>2</sup>, KAI LI<sup>1</sup> & YAN FANG<sup>1,3</sup>

<sup>1</sup>School of Life Science, East China Normal University, Shanghai, 200062, China. E-mail: yfang@bio.ecnu.edu.cn

<sup>2</sup>Shanghai Entomological Museum, Chinese Academy of Science, Shanghai, 200032, China. E-mail: liuxianwei2008@163.com

<sup>3</sup>Corresponding author

### Abstract

In the present paper, one new genus *Allocyrtopsis* gen. nov. and 5 new species including 1 new in the genus *Neocyrtopsis* are described. A key to genera and species are provided. All type specimens are deposited in the SEM (Shanghai Entomological Museum, CAS).

**Key words:** Orthoptera, Tettigoniidae, Meconematinae, taxonomy, new genus, new species

### Introduction

This paper presents a taxonomic study on genera of Meconematini from China, one new genus *Allocyrtopsis* gen. nov. and 5 new species were described, a key to genera and species is provided. *Neocyrtopsis* Liu & Zhang, 2007 elevated from subgenus to genus because it is distinguished from *Crytopsis* Bey-Bienko, 1962 by following combination of characters: hind tibiae with 3 pairs of apical spurs; male epiproct joined with 10<sup>th</sup> abdominal tergite. The new genus *Allocyrtopsis* gen. nov. is allied to *Neocyrtopsis* Liu & Zhang, 2007, but differs in its smaller body, male 10<sup>th</sup> abdominal tergite without lobes and not joined to the epiproct. All type specimens are deposited in the SEM (Shanghai Entomological Museum, CAS).

### Key to genera and species

- 1 Male 10<sup>th</sup> abdominal tergite with paired lobes; male epiproct merged with 10<sup>th</sup> abdominal tergite (Fig. 2)..... *Neocyrtopsis* Liu & Zhang, 2007 ..... 2
- Male 10<sup>th</sup> abdominal tergite without lobes; male epiproct not merged with 10<sup>th</sup> abdominal tergite (Fig. 8) ..... *Allocyrtopsis* gen. nov. .... 3
- 2 Hind knee lobe with a spine; male epiproct quadrate ..... *Neocyrtopsis variabilis* (Hsia & Liu, 1993)
- Hind knee lobe without spine; male epiproct triangular; female subgenital plate as Fig. 5 ..... *Neocyrtopsis fallax* sp. nov.
- 3 Male 10<sup>th</sup> abdominal tergite with hind margin middle concave ..... 4
- Male 10<sup>th</sup> abdominal tergite with hind margin truncated or slightly projecting ..... 5
- 4 All femora without pale brown rings (Fig. 6); male pronotum with a brown longitudinal band (Fig. 7); cerci of male slender and branched (Fig. 8); female subgenital plate triangular (Fig. 11), ovipositor longer ..... *Allocyrtopsis ornata* sp. nov.
- All femora with pale brown rings (Fig. 12); female subgenital plate pyriform (Fig. 14) ..... *Allocyrtopsis parva* sp. nov.
- 5 Body brown, legs with darkish brown spots; male 10<sup>th</sup> abdominal tergite with hind margin slightly projected, cerci wide and flat (Fig. 15); female subgenital plate as Fig. 18 ..... *Allocyrtopsis platycerca* sp. nov.
- Body pale, legs without darkish markings; male 10<sup>th</sup> abdominal tergite with hind margin truncate, cerci wide circular (Fig. 20) ..... *Allocyrtopsis tibetana* sp. nov.

## *Neocyrtopsis* Liu & Zhang, 2007

*Cyrtopsis* (*Neocyrtopsis*) Liu & Zhang, 2007. Entomotaxonomia, 29(2): 89.

Type species: *Neocyrtopsis variabilis* (Hsia & Liu, 1993)

Body small, brachypterous. Fastigium of vertex blunt conical and with a groove dorsally, last segment of maxillary palpi distinct longer than the preceding one. Pronotum of male large, almost occupying half of body, metazona considerably elevated and expanded, with low pleurite and oblique hind margin, and without humeral sinus. Tegmina shorter than pronotum, mostly concealed beneath pronotum, with stridulatory fields in male. Fore coxae with spine, each femora unarmed, auditory of tibiae open on both sides, fore and mid tibiae with movable spines on each margin of ventral surface, lower lobe of hind knee with or without spine, hind tibiae with 3 pairs of apical spurs. Male 10<sup>th</sup> abdominal tergite with a pair of lateral lobes, epiproct well developed and merged with preceding tergite, subgenital plate with styles. Ovipositor margins smooth.

This genus easily distinguished from *Cyrtopsis* Bey-Bienko 1962 by follow combination of characters: hind tibiae with 3 pairs of apical spurs; male 10<sup>th</sup> abdominal tergite and epiproct fused.

### 1. *Neocyrtopsis variabilis* (Hsia & Liu, 1993)

*Cyrtopsis variabilis* Hsia & Liu, 1993. In Huang: Insects of Wuling Mountains area, South Western China, 95. Jin & Xia, 1994. Jour. Orth. Res., 3(1): 26.

*Cyrtopsis* (*Neocyrtopsis*) *variabilis* Liu & Zhang, 2007. Entomotaxonomia, 29(2): 89–90.

**Distribution.** China (Guizhou).

### 2. *Neocyrtopsis fallax* sp. nov. Wang & Liu.

(Figs. 1–5)

**Material.** Holotype ♂, China: Sichuan, Tianquan, Laba River, Alt. 2060m, 2007.VII.28–30, leg. LIU Xian-Wei, ZHANG Feng, ZHOU Min, BI Wen-Xuan; Paratype 1 ♀, same data as holotype; 1 ♀, China: Sichuan, Shimian, Gongyihai, Alt. 2100m, 2007. VII. 22–25, leg. LIU Xian-Wei, ZHANG Feng, ZHOU Min, BI Wen-Xuan.

**Description.** Male. Tegmina reaches end of second abdominal tergite. Fore tibiae spines type 4, 4(1, 1). Middle tibiae with 4 inner and 5 outer spines excluding apical spurs, hind tibiae with 18~20 dorsal teeth each margin above and 3 pairs of apical spurs. 10<sup>th</sup> abdominal tergite broad, median hind margin merged with epiproct (Fig. 2). Cerci slender, without branches, with apex hooked (Fig. 2). Subgenital plate longer than wide, hind margin truncate (Fig. 4), styli on both sides of hind margin.

Female. Tegmina reach fore margin of first abdominal tergite, laterally situated. Cerci long, conical. Subgenital plate with basal half widened, apical half narrow, hind margin with a median notch (Fig. 5). Ovipositor shorter than hind femur, apical half curved upwards, margins smooth.

**Coloration.** Yellowish brown variegated blackish brown. Head with paired yellow stripes behind eyes, antennae with darkish rings, prozona with blackish brown markings on each side as in Fig. 1. Abdomen with paired longitudinal bands dorsally. All legs with pale brown markings and spines darkened.

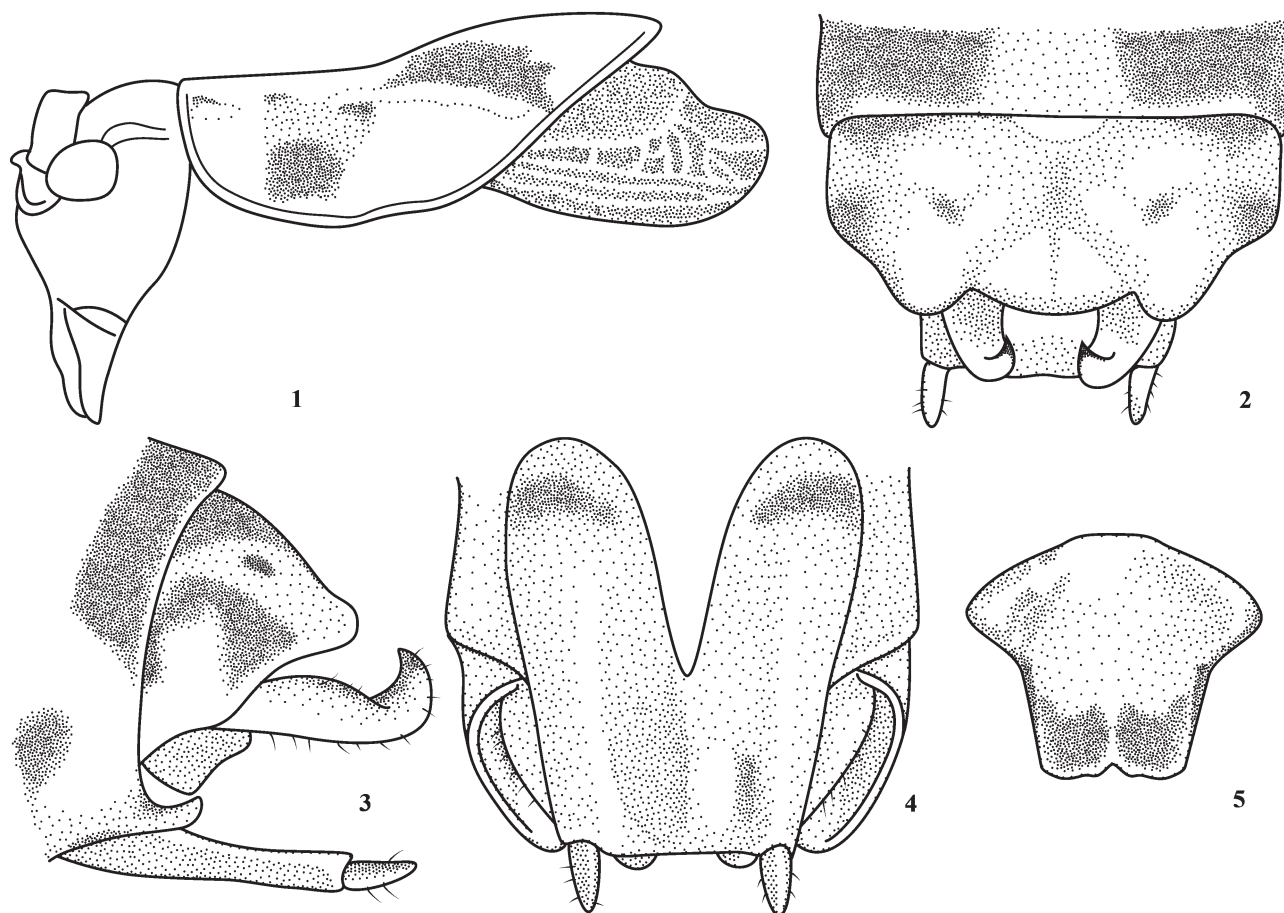
**Measurements.** (in mm)

	Body	Pronotum	Tegmina	Hind femora	Ovipositor
♂	12.7	6.5	3.0	10.6	/
♀	10.0~10.6	4.0~4.7	1.0~2.3	10.2~10.4	6.4~7.0

**Discussion.** This new species is very similar to *Neocyrtopsis variabilis* (Hsia & Liu, 1993), but lobe of hind knee spine is absent and male epiproct merged part triangular, with more curved cerci apex and different pronotal markings.

**Etymology.** The new specific name derived from Latin “fallax”, meaning it is very similar to the preceding species.

**Distribution.** China (Sichuan).



**FIGURES 1–5.** *Neocyrtopsis fallax* sp. nov. 1. Head and pronotum, lateral view; 2. End of male abdomen, dorsal view; 3. End of male abdomen, lateral view; 4. End of male abdomen, ventral view; 5. Subgenital plate of female, ventral view.

### *Allocyrtopsis* gen. nov. Wang & Liu.

Type-species: *Allocyrtopsis platycerca* sp. nov., here designated.

Body small, brachypterous. Fastingum of vertex conical, with a groove dorsally; last segment of maxillary palpi slightly longer than preceding segment. Pronotum almost covering half of body, metazona considerably elevated and expended, with low pleurite and oblique hind margin, without humeral sinus. Tegmina shorter than pronotum, most or all concealed beneath pronotum, stridulatory fields present in male. Fore coxae with spine, all femora unarmed, auditory of tibiae open on both sides, fore and mid tibiae with movable spines on both margins of ventral surface, lower lobe of hind knee without spine, hind tibiae with 3 pairs of apical spurs. Male 10<sup>th</sup> abdominal tergite without lobes on hind margin, epiproct not fused with preceding tergite, male subgenital plate with styli. Female ovipositor margins smooth.

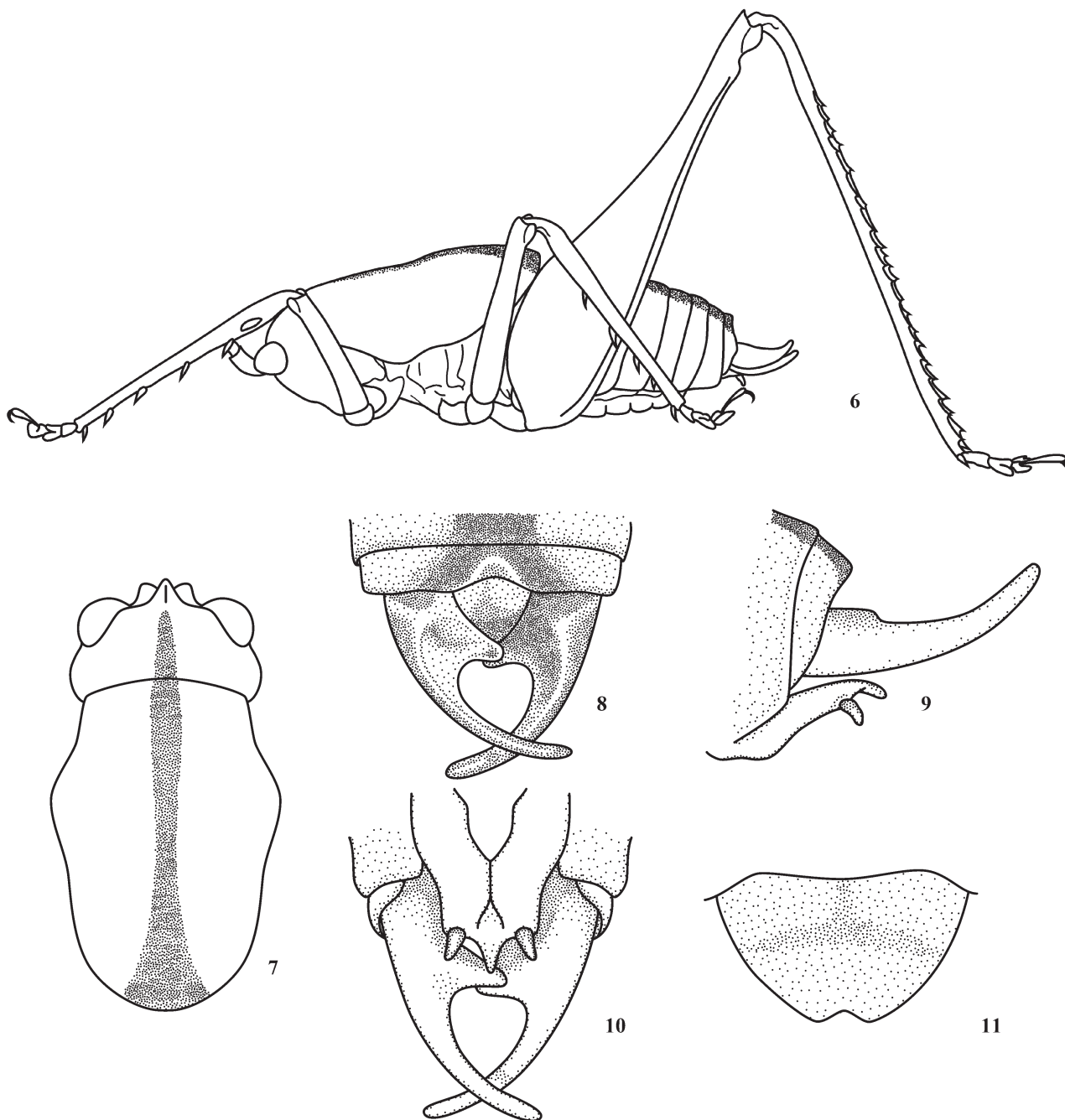
This new genus is distinguished from *Neocyrtopsis* Liu & Zhang, 2007 by its smaller body and the structure of male epiproct and its not being merged with 10<sup>th</sup> abdominal tergite.

### 3. *Allocytopsia ornata* sp. nov. Wang & Liu.

(Figs. 6–11)

**Material.** Holotype ♂, China: Tibet, Hanmi, Alt. 2100m, 2011.VII.23–VIII.7, leg. BI Wen-xuan; Paratype 1 ♀, same data as holotype.

**Description.** Male. Tegmina not exceeded hind margin of pronotum. Fore tibiae armed spinal formula 4, 5(1, 1). Middle tibiae with 4 inner and 4 outer spines excluding apical spurs, hind tibiae with 19~21 dorsal teeth each margin above and 3 pairs of apical spurs. 10<sup>th</sup> abdominal tergite with median concaved hind margin (Fig. 8). Cerci elongate, inner surface excavate, basal half with lower lobe, apical half slender and slightly curved (Fig. 8). Subgenital plate long and narrow, little thick at base, hind margin with a median finger-shaped process and styli situated both sides (Fig.10).



**FIGURES 6–11.** *Allocytopsia ornata* sp. nov. 6. Body, lateral view; 7. head and pronotum, dorsal view; 8. End of male abdomen, dorsal view; 9. End of male abdomen, lateral view; 10. End of male abdomen, ventral view; 11. subgenital plate of female, ventral view.

Female. Tegmina whole concealed beneath pronotum, situated laterally. Hind margin of 10<sup>th</sup> abdominal tergite medially notched, cerci long and conical. Subgenital plate almost inverted triangular, hind margin with a median concave (Fig.11). Ovipositor shorter than hind femur, slightly curved upwards, and margins smooth.

**Coloration.** Pale brown. Antennae with scattered dark rings. Male pronotum yellowish with a dark brown longitudinal band widened posteriorly; abdomen with a dark brown longitudinal dorsal band, dorsal teeth of hind tibiae and tarsus dark.

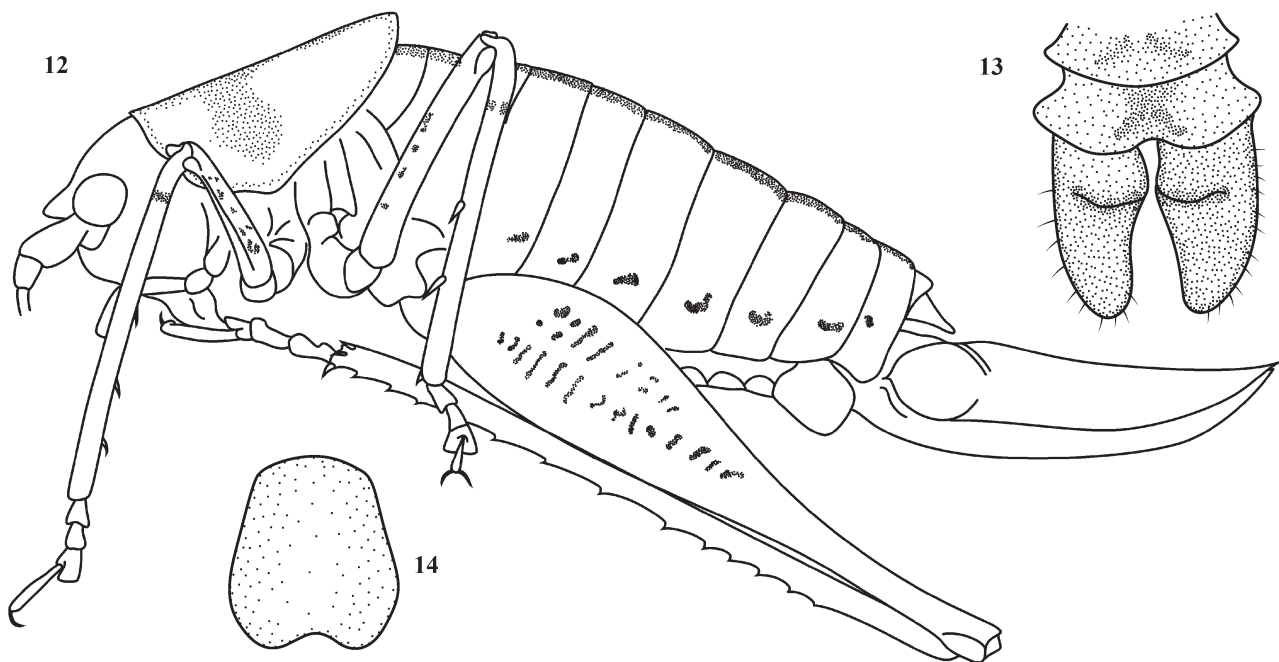
**Measurements.** (in mm)

	Body	Pronotum	Tegmina	Hind femora	Ovipositor
♂	9.0	4.6	1.0	8.9	/
♀	10.1	4.2	1.0	9.8	6.2

**Discussion.** This new species differs from other species of this genus in the brown longitudinal band of pronotum, longer male cerci, branched and inner surface excavated, subgenital plate with finger-shaped process on hind margin.

**Etymology.** The new specific name derived from Latin “ornatus”, refers the character of exterior.

**Distribution.** China (Tibet).



**FIGURES 12–14.** *Allocyrtopsis parva* sp. nov. **12.** Lateral view, holotype; **13.** End of male abdomen, dorsal view; **14.** Subgenital plate of female, ventral view.

#### 4. *Allocyrtopsis parva* sp. nov. Wang & Liu.

(Figs. 12–14)

**Material.** Holotype ♀, China: Tibet, Yadong county, Xiayadong, Alt. 2500m, 2010.VIII.10, leg. BI Wen-xuan; Paratype ♂, same data as holotype.

**Description.** Female. Tegmina concealed beneath pronotum, situated laterally. Fore tibiae spines armed 2, 3(1, 1). Middle tibiae with 2 outer spines excluding apical spurs, hind tibiae with 11~14 dorsal teeth each margin above and 3 pairs of apical spurs. 10<sup>th</sup> abdominal tergite with median process on hind margin. Subgenital plate is nearly pyriform (Fig. 14). Ovipositor shorter than hind femur, slightly curved upwards, margins smooth.

Male (probably last instar nymphs). End abdomen as in Fig. 13.



**Coloration.** Yellowish. Antennae with scattered dark rings, head, pronotum and legs mottled with pale brown, abdomen with a darkish longitudinal band and lateral spots, apex of ovipositor darkish.

**Measurements.** (in mm)

	Body	Pronotum	Tegmina	Hind femora	Ovipositor
♂	7.0	4.6	1.0	6.0	/
♀	9.1	4.0	1.0	7.2	4.1

**Discussion.** This new species is similar to *Alloctropsis ornata* sp. nov., but smaller, the subgenital plate is pyriform and the femora mottled.

**Etymology.** The new specific name derived from Latin “parvus”, refers the character of body.

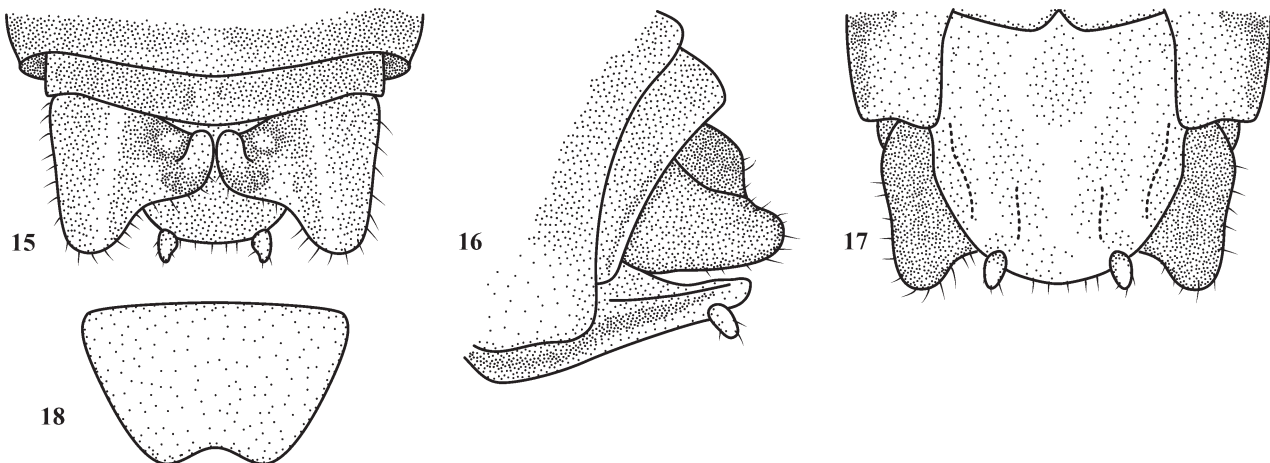
**Distribution.** China (Tibet).

##### 5. *Alloctropsis platycerca* sp. nov. Wang & Liu.

(Figs. 15–18)

**Material.** Holotype ♂, China: Tibet, Nielamu county, Zhangmu town, Alt. 2300m, 2010.VII.17–18, leg. BI Wenxuan; Paratype 2♀♀, same data as holotype.

**Description.** Male. Tegmina reaching fore part of 4<sup>th</sup> abdominal tergite. Fore tibiae spines armed 4, 5(1, 1). Middle tibiae with 4 inner and 5 outer spines excluding apical spurs, hind tibiae with 13~15 dorsal teeth each margin above and 3 pairs of apical spurs. 10<sup>th</sup> abdominal tergite with median portion slightly produced (Fig.15). Cerci short, wide flat, base with a round process and an apex upwards bent lobe, apex blunt (Fig.15). Subgenital plate nearly semicircular, styles as in Fig.17.



**FIGURES 15–18.** *Alloctropsis platycerca* sp. nov. **15.** end of male abdomen, dorsal view; **16.** end of male abdomen, lateral view; **17.** end of male abdomen, ventral view; **18.** subgenital plate of female, ventral view.

Female. Tegmina only visible in lateral view, situated laterally. Subgenital plate with base broad, tapering; hind margin median concave (Fig.18). Ovipositor shorter than hind femur, broader, slightly curved upwards, margins smooth.

**Coloration.** Brown. Antennae with scattered dark rings, head and pronotum with yellow lateral stripes. Legs with markings and spots which darkish brown, dorsal teeth of hind femora and tarsus darkish.

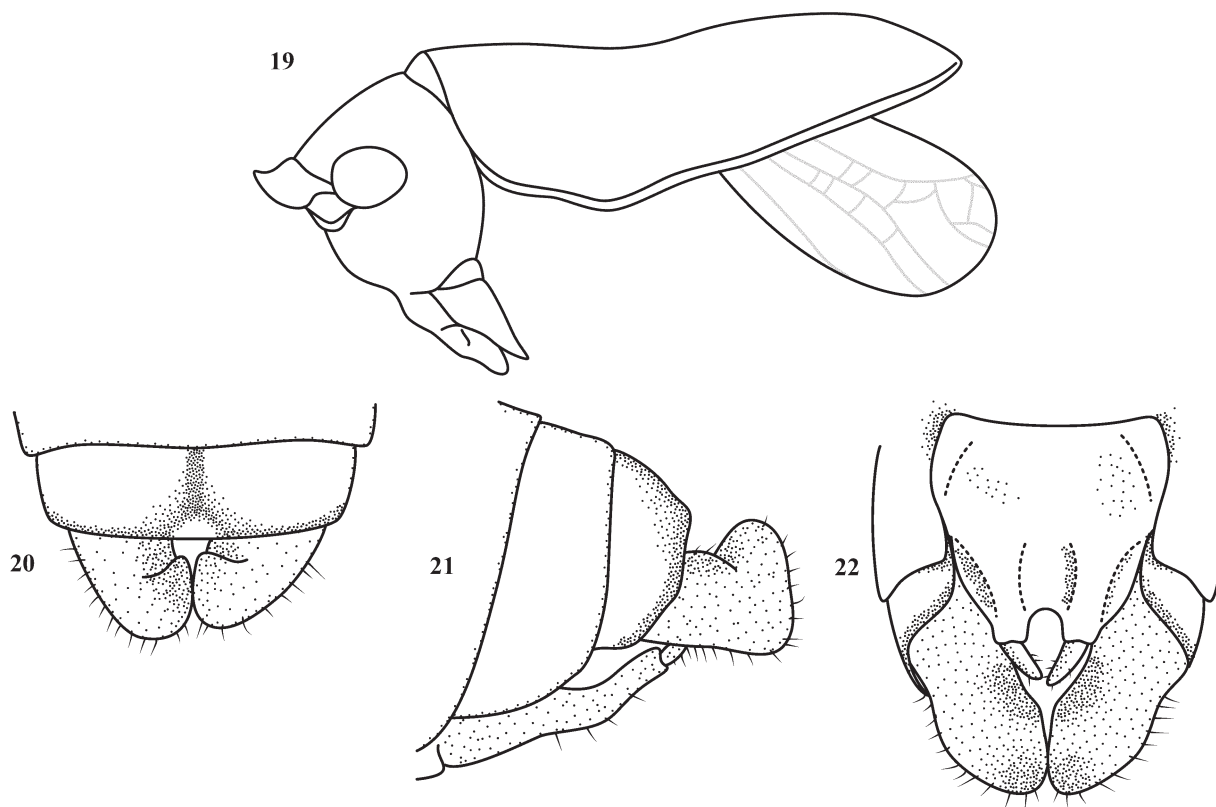
**Measurements.** (in mm)

	Body	Pronotum	Tegmina	Hind femora	Ovipositor
♂	9.2	4.9	1.5	7.7	/
♀	10.2~12.0	4.6~4.8	1.0	8.2~9.0	6.0~6.2

**Discussion.** Males are distinguished from other species of *Allocyrtopsis* by the flat cerci.

**Etymology.** The new specific name derived from Latin “platy-”+ “circus”, refers the character of male cerci.

**Distribution.** China (Tibet).



**FIGURES 19–22.** *Allocyrtopsis tibetana* sp. nov. 19. Head and pronotum, lateral view; 20. End of male abdomen, dorsal view; 21. End of male abdomen, lateral view; 22. End of male abdomen, ventral view.

#### 6. *Allocyrtopsis tibetana* sp. nov. Wang & Liu.

(Figs. 19–22)

**Material.** Holotype, China: Tibet, Le village, Alt. 2500m, 2010.VII.16, leg. BI Wen-xuan; Paratype ♂, same data as holotype.

**Description.** Male. Pronotum is large and broad. Tegmina reaching tip of 3<sup>rd</sup> abdominal tergite. Fore tibiae spines armed 4, 4(1, 1). Middle tibiae with 3 inner and 4 outer spines excluding apical spurs, hind tibiae with 12~15 dorsal teeth each margin above and 3 pairs of apical spurs. 10<sup>th</sup> abdominal tergite with flat hind margin, median portion shallowly excavated (Fig. 20). Cerci short, tubby; apex blunt and bent upwards (Fig. 21). Subgenital plate nearly inverted triangular, hind margin concave, styli produced, convergent (Fig. 22).

Female unknown.

**Coloration.** Pale yellow, faded. Tarsus and dorsal teeth of hind femora dark.

**Measurements.** (in mm)

	Body	Pronotum	Tegmina	Hind femora	Ovipositor
♂	9.2~9.9	5.8~5.9	3.0~3.2	8.5~9.1	/

**Discussion.** This new species similar to type species, but differ by color and male cerci tubby.

**Etymology.** The new species is named after its locality Tibet.

**Distribution.** China (Tibet).

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## References

- Bey-Bienko, G.Y. (1962) Results of Chinese-Soviet Zoological-Botanical expeditions to South-Western China 1955–1957. New or less-known Tettigonioidea (Orthoptera) from Szechuan and Yunnan. *Trudy Zoologicheskogo Instituta Akademii Nauk SSSR*, 30, 110–138.
- Gorochoy, A.V. (1993) A contribution to the knowledge of the tribe Meconematini (Orthoptera: Tettigoniidae). *Zoosystematica Rossica*, 2(1), 63–92.
- Gorochoy, A.V. (1998) New and little known Meconematinae of the tribes Meconematini and Phlugidini (Orthoptera: Tettigoniidae). *Zoos. Ross.*, 7(1), 101–131.
- Jin, X.B. & Xia, K.L. (1994) An index-catalogue of Chinese Tettigonioidea (Orthopteroidea: Grylloptera). *Journal of Orthopaedic Research*, 3(1), 15–41.
- Liu, X.W. (2000) Three new genera and seven new species of the tribe Meconematini from China. *Zoological Research*, 21(3), 218–226.
- Liu, X.W. & Zhang, D.J. (2007) A new subgenus and new species of the genus *Cyrtopsis* (Orthoptera: Tettigonioidea: Meconematidae). *Entomotaxonomia*, 29(2), 89–90.
- Xia, K.L. & Liu, X.W. (1992) Orthoptera, Tettigonioidea and Grylloidea. In: Huang, F. S. (ed.), *Insects of Wuling Mountains Area, Southwestern China*. Science Press, Beijing, pp. 87–113.